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EDITORIAL NOTES

VOLUNTARY OR COMPULSORY?

WE in the Gas Industry all know enough about the coal situation to realize to the full that a cut in consumption must be made by one means or the other. The reason is a simple one—that enough coal cannot possibly be mined to satisfy the present and prospective rates of demand. It is profitless to discuss and argue about the causes of this unfortunate state of affairs; they lie mostly in the past, and in any case no remedies can possibly be devised which would become immediately operative in sufficient degree to fill the breach. Therefore it behoves us as wise men to apply ourselves forthwith, with all the energy at our command, to tackling the problem from the other end. Since supply cannot be made to equal demand, we have to make demand match supply. This must be done; it will be done. Whether by voluntary or compulsory means is a matter at present very much in the balance, and we do not hesitate to say that it throws a very heavy personal responsibility upon the head of every individual gas undertaking in the land. It is really unnecessary, we know, in a question of such vital national moment to appeal to the gas engineer and manager on the baser motives of self-interest, but it is an undeniable fact that our Industry would have be bear more of the slings and arrows of a fuel-rationed public than any other; that the mystery of the therm which still persists in the people's mind would be deepened into grave dissatisfaction, especially on the proposed scale of equivalents. But let us leave such thoughts, and their very easy development into greater detail, and concentrate upon the higher motive of helping the war effort, not only by an immediate economizing of coal months ahead of any possible application of a rationing scheme, but also avoiding if we can the eventual need for such scheme, with all the risk of injury to public morale which we as suppliers of heat, power, and light know might be entailed.

The Minstry of Fuel has opened its economy campaign, and without wishing in any way to pour cold water (fashionable as the use of cold water will have to be made), we are entitled to hope that a good deal more drive and "pep" will rapidly be introduced. It is surely a matter of sufficient importance to warrant organizing on the scale of the national savings movement, but with still more intensity if possible, because immediate results are imperative. In the meantime the separate industries have their big part to play as supporters of the main effort, and we are pleased to find the national gas bodies well forward with their plans. Gas undertakings have already heard, or will shortly hear, from the B.C.G.A. a number of suggestions as to ways in which they can make a specialized appeal to their own consumers and, though at times it has been just "fashionable" to belittle the efforts of the Association, while at others their methods may have been criticized not without reason, members will be most unwise on this occasion if they fail to join in a united Gas Industry drive to educate the public in the seriousness of the situation and the part it must play in remedying it.

We understand that electricity is in full agreement with us as to certain lines in joint publicity which can profitably be followed, and such a united appeal from two industries which have always been regarded as cut-throat competitors can but help to bring home to the public the very necessary feeling of urgency. But general publicity, largely in the shape of advertising, can only go a certain distance, and we do most earnestly back the national appeal to each individual undertaking to jettison for the time being all thoughts of conserving hard-won loads, and to assume direct personal responsibility, according to its situation and circumstances, for its share of the general cut which is called for, and so do its part in saving the country from the need for compulsory rationing. It would be presumptuous of us to suggest to gas engineers technical means by which possibly economies may be introduced from the works end, whether in manufacturing methods, by manipulation of pressures, or otherwise. We do believe that very nearly everything is fair in a war of this kind, and if the consumer does not receive quite the superservice to which he is accustomed he should be thankful that he is being saved from himself. Then it is well known that in industrial usages, in spite of all efforts that have been made, there is still very considerable scope for gas saving. Therefore still greater efforts must be made and the manufacturer also be saved from himself, being no longer entitled to argue that it is legitimate to waste fuel so long as he can pay for it.

So we could continue, but from whatever angle we regard the subject, we realize that yet one more responsibility has been thrown upon the engineer and manager, or whoever is responsible for the working and conduct of the individual undertaking. Circumstances differ so widely that general rules cannot be laid down to cover all cases; but the problem is the same everywhere—to cut coal consumption by one-eighth or more. We certainly do not underrate the magnitude of the task of persuading people that it is a matter which vitally concerns them personally, and not their neighbours only. The question is complicated by the fact that in the rationing which we have so far experienced—food, clothing, and so on—there really has been enough to satisfy all reasonable demands, and the public, without looking too closely into figures or even being able to understand them, is liable to assume too readily that the same will hold good for fuel, and not to worry unduly whether the Beveridge scheme or any other is eventually imposed. Our own view, therefore, which does not necessarily imply a poor opinion of our fellow man, is that propaganda of the threatening type is likely to be of more value than any appeal to go canny with the hot water in order to leave enough gas for making munitions of war. If it could be brought home to Mr. and Mrs. John Smith just how much (or little) hot water they could have under the suggested scale, we believe this would induce the requisite thought and care more surely and more quickly than any other method. But, as we have already said, the matter is largely one for individual treatment, and we do most earnestly hope that the whole of the Gas Industry personnel will realize what is at stake, and give thought and energy in full measure—and quickly—to impressing on their consumers the urgency of the situation.

POST-WAR BUILDING

WE had a further opportunity last week of an interview with the Director-General of Post-War Building, when we were informed of the progress being made by the Ministry of Works and Planning in its committee organization scheme designed to unify the activities of existing groups concerned with every branch of building activity, including the fuel and power interests. As we explained in the "JOURNAL" of March 11, the Directorate is not undertaking any research or experiment of its own, but is collating existing information. Last March fifteen committees dealing with various aspects had been convened; there are now 22; several more are projected. A major item is information on the most efficient methods of heating, ventilating, and lighting. For this purpose an "installations policy committee" has been set up, to which "study committees"

will report. The information will be sifted and clarified, and the aim is to produce a building code adherence to which will ensure that building in this country after the war will give better value for money than has so far been offered. The Gas Industry is surely destined to play a major part in the provision of heat comfort in future dwellings, in view of which we expressed surprise when we last referred to the Directorate's scheme that the Industry was not represented by any committee. The omission has since been remedied, and there is now a Gas Installations Committee with The Institution of Gas Engineers as convener and with Mr. R. J. Rogers as Chairman. Its terms of reference are "to review existing information and practice concerning gas installations in buildings, from the point of entry of the gas at the property boundary up to the point of its delivery to an appliance, and to make recommendations for practice in post war building." It is easy in the midst of war to criticize the formation of committee upon committee, and there is, indeed, plenty of criticism abroad; but we think that the Directorate's scheme is bound to prove helpful in very many directions in the immediate as well as the more distant future, and we are glad that the Gas Installations Committee has got speedily and, we believe, effectively to work.

A few days ago we were reading a book from which we quote the following. The book in question was published in 1918 and was concerned with English history: "The Great War has meant terrible destruction and will inevitably be followed by a period of reconstruction. There is a new spirit abroad. . . . Cottages are wanted for the countryside. Our towns have to be made clean and tidy . . . good healthy houses which can be made into homes must take the place of the slums, and fine schools and public buildings will show that we have gained in civic spirit." During the 20 years between the last war and the present war we built four million houses; execution of this programme, however, fell short fundamentally and in many ways through lack of co-ordination of the various interests involved. As one example only, though not a minor one, there was absence of co-operation between the architect and the industries supplying heat and power. It is right that remedies should be sought to the failures of the past, and that the causes of these failures should be clearly stated and widely understood. The problems facing us at the end of the present war will be greater; they will be different from those which followed the last war, and obviously they will have to be tackled differently and with the minimum time-lag. For which reason we look upon the scheme of the Directorate of Post-War Building as a practical attempt to grapple with an immense and complex task, and not as a theoretical conception which appears well enough on paper but is marked merely by wishful thinking. We cannot expect to be ready overnight for peacetime development.

Standardization of certain codes of practice in installation work is needed—and fortunately consideration of standardization is not new. As far as the Gas Installations Committee is concerned, previous work of the Industry in conjunction with the British Standards Institution will doubtless prove of great value in the formulation speedily of the recommendations asked for by the Directorate of Post-War Building. The Committee will report in October, and it should be able to report on certain matters clearly and succinctly, on methods of carcassing in relation to safety and a really adequate supply of gas at all the consumption points needed, on point positioning, and so on. On other matters it will have freely at disposal information on the likely lines of new building technique determined by the likely availability of both known and new materials of construction, and it is obvious that some of the known materials will be in restricted supply, which fact will at once influence and modify gas installation methods. Nor do we think that the problem as a whole is one only of post-war building. There is a present problem of housing and re-housing, and the more this is undertaken in co-operation, the better, particularly in view of the shortage of supplies and labour. The Gas Industry can assist in the solution of present as well as of post-war problems.

Fuel Economy

As a sidelight to our editorial on fuel rationing on the previous page we may, to mirror events, refer to some of the activities on the fuel economy front during the past week. It has been suggested that the indications that voluntary rationing will have a fair trial are discouraging—that the public has yet to be convinced that the Ministry of Fuel believes in the voluntary saving it preaches, that before the national campaign for fuel saving got any impetus, active preliminaries for compulsion were begun. Official forms are to be delivered within a week or two to householders, and it is argued that most of them will be little inclined after that to think in terms of voluntary saving. In a broadcast last Thursday Sir Harold Hartley concentrated on domestic consumption, maintaining that if we had a small quantity of water for our baths—and then only when the water, with a storage system, was not specially heated for the purpose—we could save 1,000,000 tons of coal a year, that if every household saved 2 lb. of coal a day in the seven colder months the cumulative saving would be 2,000,000 tons, and that if we sifted our cinders another 1,000,000 tons of coal could be saved. Small individual savings count enormously when translated to a national scale. There have been several letters in the Press urging more emphasis on the necessity for economy of coal in industry —which consumes three-fifths of our coal. Recently, in Wales (last week's "JOURNAL," p. 57), the Director-General of Gas Supply stated that if due thought were given to the matter by everybody concerned, a saving of anything from 10% to 20% could be made in industrial gas consumption in every district and with existing gas-using equipment. The point at issue is not the cost but the availability of the fuel. Where this point has been grasped it has been shown beyond doubt that higher rates of production can be achieved by the use of less gas. In his Presidential Address to the Combustion Appliance Manufacturers' Association (*ante*, p. 58), Mr.W. Rennie said that small-scale industrial consumers using some 60 million tons of coal a year, mainly for steam generation, may be assumed to operate at an average efficiency not exceeding 60%. An increase to 66%, technically feasible, would represent a saving of 6,000,000 tons a year. While individual savings are being advocated, and after discouraging holiday travel, the Minister of War Transport has informed railway companies that they may run some additional trains during the rest of the summer. In the House of Commons last Wednesday he explained that the additional coal required for extra trains would be "relatively small." Is this a good example to the industrial user or the householder? We find it rather confusing.

Personal

Mr. F. HIGGINSON, General Manager and Secretary to the Petersfield & Selsey Gas Company and General Manager of the Selsey Water Company, retired on June 30, after having served 25 years in these capacities. Mr. Higginson has served the Gas Industry for over 50 years. Before going to Petersfield he was with the Elland, Holmfirth, and Broadstairs Gas Companies.

Mr. A. W. CLARK, for some years Mr. Higginson's assistant, has been appointed General Manager and Secretary to the Petersfield & Selsey Gas Company and General Manager of the Selsey Water Company as from July 1.

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Mr. H. G. RITCHIE, Engineer and Manager to the Falkirk Gas Department, has been elected President of the Falkirk Rotary Club for the ensuing year.

Obituary

Many gas engineers in London and the Home Counties will learn with regret of the death on July 11, after a short illness, of Mr. THOMAS R. HILL, at the age of 79. For 45 years, until his retirement in 1933, Mr. Hill was Manager, and later a Director, of Messrs. Henry Edie & Co., Ltd., The Bow Foundry, E. 3, which firm carried out a great deal of work for the London gas companies. His father, Thomas Rowland Hill, was a Director of the South Metropolitan Gas Company, and his son, Mr. H. R. Hill, is with Messrs. Bratt Colbran, Ltd.

The fact that goods made of raw materials in short supply owing to war conditions are advertised in the "Journal" should not be taken as an indication that they are necessarily available for export.

POST-WAR PLANNING*

By ROBERT COWIE, Hawick

FOR many years there have been staunch advocates of the thesis that the Gas Industry should develop complete gasification and aim at the sole production and sale of gaseous fuel. It is pleasing to know that research is proceeding on these lines, research which may ultimately revolutionize the Industry. But even if successful this development will take time, and does not alter the fact that the immediate concern of the Industry must be to strengthen its position as a unified industry, and to take such steps as will ensure a rightful place for gas in the immediate post-war period.

The ability of the Industry to take its place in the economy of the nation will to a large extent depend on the co-ordination and unity achieved within the Industry. The appointment of Dr. Smith as Director-General of Gas Supply has met with the unanimous and enthusiastic approval of the Industry. The Industry is a great but straggling growth, and because of its somewhat sheltered nature the need for co-ordination and unity has not been sufficiently recognized. The appointment of a Director-General who understands the difficulties and complexities of the situation is a tremendous encouragement to those who are seeking a solution. By this appointment the Government has provided an opportunity which the Gas Industry will neglect at its peril. The Government can provide the facilities for approved plans, but surely it is the business of the Industry to do the planning.

Ministry of Fuel

The mere setting up of a Ministry of Fuel will not ensure the position of the Industry. All that any public service can ask of a Government is recognition of service to the community, an opportunity to develop its service, and favourable consideration only as it is deserved—always bearing in mind that if the Industry fails to develop its service in the general interest the Government has a duty to the public to see that any such failure is remedied.

There clearly seems to be a need for an authoritative factual survey of the Gas Industry adequately illustrated by appropriate statistics. To the best of my knowledge no such up-to-date survey has been made. There is, of course, the very valuable P.E.P. report on the Gas Industry, but as this is "a survey of current trends and problems of the Industry, with proposals for its future development," it is not exactly appropriate. A survey on the lines indicated might very well be undertaken by the National Gas Council in collaboration with the Society of British Gas Industries. Meanwhile our other national organization, the British Commercial Gas Association, in collaboration with the Industrial Gas Centres, is well fitted to prepare that part of the work dealing with the extent to which gas is rendering invaluable service in the domestic and industrial spheres. Even with all the excellent publicity carried out before the war, it is doubtful if the man-in-the-street, the ordinary M.P. in the House of Commons, or the Peer in the House of Lords, realizes the extent of the public service performed by gas in home and industry. It may not be possible to publish such a survey during the war, but a start might be made even now to collect data and statistics. Surely this would have the support and backing of the entire Industry.

Details of the important contribution which the Industry is making in the present national effort cannot be made public, but there seems no reason why the public should not be told in general terms of this contribution to victory. Incidentally, it is a matter for regret that the Industry, through the appropriate national organization, has not so far during the war made use of the public Press for prestige advertising on a national scale.

The various national organizations, such as the National Gas Council and the British Commercial Gas Association, are of comparatively recent origin. They have performed their functions admirably, but as they are voluntary Associations they can only function to the extent that their constituent members determine. Unfortunately, they have not had 100% support from gas undertakings. As far as Scotland is concerned, many of these undertakings who have not given their full support are under the control of local authorities and the management is seldom to blame for their non-participation. No doubt it is this lack of complete support that has hindered the effort to form such a really effective co-ordinating body as it was hoped the (so far ineffectual) British Gas Federation would be. If, as seems likely, some form of controlling authority is to be set up by the Government, then the Industry must lose no time in co-ordinating the work of the various organizations and interests. The existing national organizations provide the obvious foundation upon which to build a new structure. This foundation has, however, obvious and inherent weaknesses, and may have to be reinforced by some form of compulsion.

Disappointment has been expressed at the failure of the national organizations to formulate "far-reaching proposals for the administration and financial control of the Industry." These organizations are obviously well fitted to undertake planning. That they have not been more active in this sphere is possibly due to their constitution on a voluntary basis.

The most valuable work which the present organizations could undertake at the moment is an examination of the position and a formulation of proposals which would achieve the unity and co-ordination which is so essential. The fact that this has been neglected in the past is no reason why it should not be tackled now. It may be that it is already in hand by the Post-War Planning Committee of the Gas Federation—if so, it should have the backing of every member of the Industry.

Regionalization

Regionalization may be something which is forced upon a reluctant or indifferent industry from without, or it may be the natural evolutionary development of an industry determined and wise enough to be master of its fate. There is much to criticize when we look for a "unified national industry," but, on the other hand, there is also cause for congratulation in the progress that has been made during the last 30 years, a period of fiercest competition from without and many experiments within. The Industry is fortunate in its leaders, and it will be readily agreed that the personnel of the post-war planning committees is excellent. There is admittedly some overlapping and what looks like a lack of planning in the planning itself, but it could not be otherwise with the Industry as at present constituted. Good leaders are of little avail, however, if they are not backed up by the rank and file, and to give intelligent support there must be some knowledge of the problem.

A National Gas Authority

Can we not visualize a national federation whose executive committee would maintain close contact with the Gas Department of a Ministry of Fuel, Gas Commissioners, or the Directorate of Gas Supply, as the case may be. The main function of such an executive could be to cover the whole field of the Industry's activity and to speak for it in matters of policy. In order to achieve the maximum co-ordination the national gas organization might embrace four national bodies, as follows:

(1) **The Institution of Gas Engineers.**—No change in the function or character of The Institution is desirable other than that it may wish to relinquish legal or commercial questions which can now be taken care of by the national organization which it has created.

(2) **Gas Industry Commercial Development Association.**—By this it is suggested that provision be made for co-ordination of the existing publicity and marketing associations by forming a parent body with some such title.

(3) **The Society of British Gas Industries.**—This body would function much as at present, but in co-operation with (1) and (2) and within the National Gas Organization.

(4) **The National Gas Council.**—This would, much as at present, take on the function of a clearing-house and adviser on legal and administrative matters and would act as a liaison with the Government Department, leaving the larger question of policy to the parent body.

In addition, the need for an organization to protect the interests and status of the personnel of the industry is obvious. Such an organization could best function as an independent unit and would, of course, have to be constituted in accordance with the Trade Union Act. It could hardly claim a place in the Central Gas Association.

Government powers might simply be that the National Gas Authority would be the only channel through which contact might be made with the appropriate Government Department. Alternatively, it might be made compulsory for gas undertakings to become members of the National Organization. There are, no doubt, other and possibly better methods of stiffening the Organization, but powers of some kind are necessary. In the course of time a Central Authority which enjoyed the confidence of the Government on one hand and the gas undertakings on the other might acquire powers to control the development of the Industry on carefully planned regional lines and exercise authority in such matters as plant extension, linking up of undertakings, and the bulk supply of gas.

The Scottish "District"

It is appropriate that a Waverley Association meeting should discuss such questions as far as Scotland is concerned. The whole of Scotland is regarded as a district for the purposes of the national organizations, such as the National Gas Council, the British Commercial Gas Association, the Federation of Gas Employers, and the Coke

* From the Presidential Address to the Waverley Association of Gas Managers.

Association. In accordance with the terms of the constitution, the district members meet annually to elect a district management committee and representatives for the national committees. In practice, however, we find, and I think this is common to other districts, that the personnel of these committees is almost identical; in many cases the representatives are appointed in virtue of the fact that their particular undertaking is a large subscriber and not because of any specialized knowledge. The term "management" in the name of the committee is hardly justified, because the management is carried out to a large extent by executive officers at headquarters. The members of committee spend much more of their time at meetings hearing reports of work carried out on their behalf in London than they do in reporting what is being done in the district for the Industry. Individual members are swamped, in peacetime at any rate, with voluminous reports and minutes, many of which are quite unrelated to the undertaking in question, and which are too often filed away, or thrown away, unread, and certainly undigested, with the result that important points are sometimes overlooked. All too often, especially in the case of small and medium-sized undertakings, instead of having enthusiastic members, the national organizations have grudging subscribers. All this is unhealthy.

The setting up of a Scottish Office to co-ordinate the various organizations has done much to improve the position in this district. This principle could be extended by some form of co-ordination in regions. The principle has already been established, and we have in our "commercial section" something to build upon. For some time the commercial sections, of which there are three in Scotland, have not functioned as fully as they might, largely because there has not been enough for them to do. At one time they performed a very useful function in assisting undertakings to co-operate and collaborate in the effective selling of coke and tar and in the buying of coal. Coke is now covered by the Coke Association, tar by co-operative schemes, and representations to the coal owners are made through the National Gas Council. If the national organizations could operate directly through the commercial sections much time could be saved and more direct contact be obtained. The only obvious objection is that undertakings represented at commercial section meetings are not necessarily members of the organizations. This is not an insuperable difficulty, but a situation which might be turned to advantage and used to increase the membership of the national bodies. It is an advantage rather than otherwise that in each of our commercial section districts or regions there is at least one large undertaking which exerts a considerable, in some cases a controlling, influence in commercial operations.

This is a good start for regionalization. Delegates to the district committees might be appointed from the region, and a specialist from the large undertakings along with representatives from the other undertakings would be quite useful. These delegates could report at each monthly meeting. Regular personal contact with the members of the region would enable them to represent adequately the needs and desires of the region at headquarters and interpret the views of headquarters and the other regions to their own group.

A Regional Development Board

It is not difficult to visualize each region with its own "Gas Industry House" under the care of a capable full-time organizer and publicist. Here are some of the functions which such a regional centre might ultimately perform: Marketing and publicity, coke marketing; planning for development of bulk supply; training of gasfitters; training of technical assistants and assistant administrators; domestic gas appliance centre for demonstration and testing; organization of Salesmen's Circle meetings; training of salesmen and operation of a pool for specialized salesmen and fitters; statistical office to collect and collate statistics for various Government Department and other interested bodies; organization of Women's Gas Council in the region; consulting engineers' department and central drawing office; consulting chemist and central laboratory; regional sales development consultant and publicity bureau.

At some stage in the evolutionary process a Regional Gas Distribution and Development Board would obviously have to be formed in order to obtain funds from the various undertakings, and to operate on their behalf and to employ the necessary specialists on a part-time basis. Regionalization on these lines would preserve the independence and initiative of individual gas undertakings, and at the same time put no obstacle in the way of amalgamation or closer working where desirable. It should, therefore, commend itself to the majority of gas undertakings.

Regional marketing will not be possible until some degree of uniformity in the selling price of cookers is established, and it is difficult to justify the differences which at present exist, differences amounting to as much as 30% of the selling price of the cooker, unless it be due to the irresponsible idiosyncrasies of individual engineers.

As far as is known, no consideration has been given to the standardization of other appliances. In space heating and water heating there is room for tremendous development and consideration of standardization is premature. It would seem reasonable, however, in the case of water heating to lay down minimum standards for output in the case of instantaneous heaters and capacity in the case of storage heaters in order to prevent the use of appliances which are inadequate to give a useful service. Discussions have frequently taken place on the relative merits of instantaneous and storage type water heaters. These discussions only serve a good purpose in so far as they bring out the respective merits and demerits of the two types. Obviously there is a place for both, and a Domestic Gas Centre in each district, which could give authoritative advice to local undertakings, would be of considerable assistance in ensuring that the individual consumer bought the appliance best suited to his needs.

Standardization of appliances, apart from details mentioned above, would not appear to be in the best interests of the Industry or of the consumer, but there does seem to be a need for some uniformity in sales development policy. Plans drawn up now could be put into practice as soon as the opportunity arises. In the meantime it is most important that contact be made and maintained with the Scottish Post-War Development Committee, the Department of Health, the Ministry of Works and Buildings, and other similar bodies. The national organizations have undertaken much of this work, but it is essential that they have the utmost help and co-operation of their members.

In post-war building it is possible that gas equipment, or that of our competitors, may be installed by the builder and sold or rented as part of the house. If the Industry is to take its proper place in the supply of domestic heat, then some selling organization will have to be set up to handle this business, which will be on a considerable scale. Under a regional scheme a group of undertakings might employ a specialist to interview architects and builders. Even when qualified to do so, the engineer and manager of the smaller undertaking is too preoccupied to deal adequately with this subject and should welcome the assistance of an expert.

Prior to the war there was no uniformity in the charge for capital expenditure on mains and services for building schemes. Some authorities made considerable contribution to this expenditure, while in other cases gas undertakings were required to lay mains and services at considerable expense for a problematical load. This is obviously unfair either to the gas undertaking or to the community. It should be possible for representatives of the industry to meet the appropriate Government officials and draw up an agreement which would be equitable to both parties.

It would seem that neither the appliances nor the consumers are as sensitive to changes in calorific value as was at one time supposed. Calorific value standards can be raised or lowered from 5 to 20 B.Th.U. without materially affecting distribution or sales problems. Mr. Jamieson, of Edinburgh, stated recently: "I would therefore suggest that two calorific values only are required in Scotland—400 and 450 B.Th.U.—and it would be a fine, indeed a leading, gesture of Scottish unity and nationalism if one standard value, say 425 B.Th.U., could be adopted."

Two important advantages would be gained by such a standardization. Firstly, it would result in a simplification of appliances, and, second, it would have an important psychological effect on the consumers. It would make possible the manufacture of meters to read directly in therms.

"Sulphur Must Go"

The reduction of sulphur compounds in town gas is another subject which has received much publicity lately, and its importance has not been overstressed. In Scotland, however, the problem is not so acute as in England. Hawick Gas Company carbonizes coals which are as nearly sulphur free as can be obtained, and with benzole extraction the sulphur content of the gas at the holder outlet is less than 4 grains per 100 cu.ft. A reduction of sulphur content is the only answer to much of the competition for space heating with which we were faced prior to the war. During the last ten years in my own district one in every three domestic consumers has purchased a flueless heater, and I question very much if these heaters would have been so popular had our gas contained upwards of 10 grains of sulphur. The loads capable of most development are space heating and water heating, and in both of these a negligible sulphur content is of the utmost importance.

It is now becoming generally recognized that we must adopt tariffs that will enable the consumer to utilize gas at such a cost, after he has paid the comparatively small standing charge, as will enable him to displace cruder forms of heating. In my opinion, the quarterly period is too long for the average domestic user, and places gas at a disadvantage in comparisons of cost with solid fuel which is purchased at more frequent intervals.

A Coke Association has at last been formed in Scotland, and it is hoped that it will receive the fullest possible support from gas undertakings. Scottish coals carbonized in continuous vertical retorts provide a smokeless fuel which has many advantages over raw coal, and, given due attention to sales methods, there should be a much extended use of coke for domestic purposes after the war.

National unity and regional co-ordination are complementary and must be considered together. It is necessary to take a long view, and in any reconstitution which takes place provision must be made for the development of regional co-ordination. It would appear that planning from the top is well in hand; planning from the bottom upwards is secondary, but nevertheless important.

Discussion

Mr. E. V. **Evans,** O.B.E., President of The Institution of Gas Engineers, dealing with the British Gas Federation Post-War Planning Committee, said they had twelve representatives, three each from the Institution, the National Gas Council, the B.C.G.A., and the Society of the British Gas Industries. They had divided themselves up into four working committees. One dealt with manufacture and distribution, with the object of reducing the cost of a supply of satisfactory gas. It interested itself in the thermal efficiency of the carbonizing processes throughout the country. The second was the Utilization Committee, considering how the consumer might use more gas, studying the thermal requirements of the various classes in the community and seeing what was really required to give a comprehensive service to each class of consumer. A memo. had already been prepared dealing with what could be done after the war in the domestic field. The third Committee dealt with Methods of Charge for Gas and Appliances, the future development of the Industry largely depending on this. Finally, the fourth Committee dealt with the reorganization necessary within the Industry to carry out the standards about to be laid down by the other three. Thus they had three technical and commercial committees setting out on paper what they felt was the ideal Industry, with the fourth committee planning how this might be achieved.

Mr. D. **Fulton** (Helensburgh) said that as Chairman of the B.C.G.A. Management Committee in Scotland he had invited the committee members to send him their ideas on post-war planning for the Industry. He was trying to edit these views into a cohesive whole. They had many post-war planners, but they had no idea what their world would be like after emerging from the present welter. It would be a sterner world, in which they would work harder and live more austerely. The Gas Industry was not indispensable, but could be made indispensable. They had to realize that and give the public a better service than ever before. Competition would be much keener, and they had to be active and alive to meet it. Mr. Cowie was a valuable member of the B.C.G.A. Committee and full of ideas. He had convinced himself that a Ministry of Fuel was needed. It was easy to say that if we had a Ministry of Fuel all would be well, but what were its functions to be?

With regard to regionalization, Mr. Fulton said that the grouping of undertakings in areas must be done on a well-planned basis, avoiding the error of indiscriminate purchases by holding companies without the ability to merge them into a cohesive group. Varying prices in neighbouring places were a handicap, as also was the wide difference in calorific values. This would be prevented by regionalization. The qualifications of those who would conduct the Industry after the war and the demands made on them would be greater than those in the past, and it behoved them to select the right kind of people to enter the Industry.

Mr. **T. Harper** (Ayr) said that if the Government had a scheme in preparation, the sooner the Industry knew about it the better. It was essential that they should not wait till after the war.

Mr. **D. Campbell** (Secretary, Caledonian Gas Corporation) said that the idea was abroad that union or co-operation with others meant the loss of individuality, but a sea captain took instructions from the Admiralty and yet remained the captain of his ship. So far they had advice but not direction. They had overlooked one point—were the gas managers the real bosses? They might be the technical people, but the policy was often planned by others. He knew of gas engineers restricted in their purchases, sales, and other matters by local boards of directors whose outlook was parochial, and who were not interested in neighbouring undertakings.

Mr. **T. A. Rowan** (Grangemouth) suggested that the elimination of the sulphur content, constant pressures, and standard calorific values would give a new meaning to gas service.

Mr. **W. M. Henderson** (Dalkeith) asked whether any unity of purpose had been accomplished between their Industry and its allies—electricity, oil, and solid fuel.

Mr. **D. D. Melvin** (Edinburgh) said that if post-war development was to proceed on the lines suggested he saw little prospect of the admirable function of the regional centre being fulfilled and adopted by all undertakings. If compulsion was to be applied to all undertakings to join the national bodies, then similar powers were essential to ensure that undertakings put into effect the decision of the Management Committee or governing body.

Individualistic methods and attitudes would require to be submerged for the general good, although he agreed with the President that they must always maintain and foster local enterprise and initiative, which contributed so much to goodwill and service. He submitted that the voluntary method would not produce the measure of progress needed.

Mr. **W. C. Campbell** (Galashiels) said that unification of the Industry could not be achieved without a certain degree of State compulsion. The need for co-operation between different undertakings had been practically illustrated time and again in recent years, and the helplessness of small undertakings in the face of wartime difficulties had provided ample proof of the need for and value of unification and centralized control. They had been asked to reorganize from within, but he could not see this being done without some outside influence being brought to bear. Many undertakings were operated for private profit, and naturally the views of the owners had to be given consideration. Only compulsion would overcome existing prejudices against outside influence and control. It would serve the purpose if the Directorate of Gas Supply were vested with powers similar to those of the Electrical Commissioners. The Directorate could appoint Regional Advisers who, in turn, would appoint District Advisers. A District would encompass areas somewhat similarly located as under the present Mutual Aid Schemes. A District Committee would operate under the District Adviser to examine and consider schemes for promoting gas interests in the particular locality. The Regional Adviser would be a permanent official controlling a staff of qualified specialists operating from an establishment set up in the focal point in the region. General policy could be formulated by the Directorate, practised by the Advisers, and operated by the District Committees.

Mr. **J. M. Dow** (Kirkcaldy) said there were so many obstacles in the way of regional development that progress after the war towards this aim must of necessity be slow.

The **President** thanked those who had contributed to the discussion and then called on Dr. E. W. Smith.

The Industry's Present Status

Dr. **Smith** said the policy of the Directorate had been to cause individual members of the Industry to start thinking. Mr. Cowie had saved him a great deal of trouble. He could not himself have written a better Paper. Mr. Cowie's father should be very proud of his son that day.

Mr. Evans and he had worked together for many years and it was a mere accident that he himself stood where he was that day. Their Industry, said Dr. Smith, must not live on reputation, but on what they could do and the service they could give. They had given good service in the past, but the world was changing. Oil could be got better now than in the last war and so could coal. What were *they* doing to better their position? Fortunately he, Dr. Smith, was finding every evidence in all quarters of a determination, by whatever means proved necessary, to make the Gas Industry a modern national and truly utility undertaking instead of a group of over a thousand small undertakings, each working in a parochial way. Now that the Ministry of Fuel had been set up many possibilities might be visualized. There would be four sections—oil, gas, coal, electricity—with directors, chairmen, or commissioners, and the machinery would be ready made, if thought desirable, for the formation of a Board to advise the Ministry on regional fuel policy of a national nature.

To-day their Industry had a status which it had never had before. It now had recognition in Government circles which its service demanded, but they would only keep that recognition as they kept pace with the growing industrial and domestic services. Since September last there had been great changes. Their Industry was now protected by the Heat Supplies Committee, which watched over their interests. If equipment or labour were needed, for example, the matter came through this Committee and the necessary steps were taken. They were getting quick returns and many of their problems would be solved. There would not be the same trouble this winter as there was last winter. In munition and other factories he found the Industry had a high reputation, not only for the way it had overcome the "blitz" results but in other ways. But it needed an extension of the spirit of voluntary co-operation so much that imposed co-operation would eventually be welcomed.

Gas was a public utility and he visualized certain dangers. There was the danger of nationalization with its bureacratic control, and there was the danger of excessive local government influence which ultimately might amount to obstruction. Something between was wanted. Probably in their heart of hearts nobody believes that all necessary reforms can be effected without legislation, and quite possibly, when their deliberations are further advanced, the Industry's Post-War Planning Committee will apply to the Directorate for help in effecting the necessary legislation. Any Government enquiry which might precede it would be directed towards making the Industry a more effective national public service than ever before.

Should they be discussing these things in view of the war? If a discussion on post-war planning impeded the national effort in the slightest degree he himself would have nothing to do with it. His instructions were to provide an adequate supply of gas where needed, and to advise the Ministry as to what could be done to improve the Industry as a public utility. He pictured the regionalization of the Industry, with the parochial influence of local authority or board of directors eliminated. There would be a type of management control which would be divorced from bureaucracy. Modern accountancy would be brought in and there would be adequate chemical and physical control everywhere. He appealed to gas engineers to use their imagination and secure the maximum saving of coal, employing the minimum of labour and obtaining the greatest efficiency so as to render the utmost possible contribution to the war effort. One of the things that should be done by agreement was to see that the sulphur content was not higher than 8 grains anywhere. Consumption of gas in industry might tend to go down after the war, but there would be a rise in consumption elsewhere. There was a tremendous future for sulphurless gas and also for coke as a domestic fuel. Anything done now in the way of coke would be rewarded later by a first-class market.

DISCUSSION ON INSTITUTION PAPERS

THE CONTRIBUTION OF THE GAS INDUSTRY IN THE DOMESTIC FIELD TO NATIONAL FUEL ECONOMY

By Dr. HAROLD HARTLEY

(*Concluded from p. 69*)

Mr. **J. F. Davis** (South Metropolitan): There may be room for difference of opinion on some of the data accepted and, perhaps, upon the method of expressing heat requirements upon a daily basis. One of the most important factors to be considered in domestic fuel supply is the variation in requirements from day to day, month to month, and from family to family. Adoption of the same calorific value per lb. for coal and for coke is being rather too generous to coke, and the gibe at the gas water-heater that gives a mere trickle is hardly fair. Gas water-heaters can, and do, give as ample a supply as anyone could desire, if the proper apparatus be employed.

In Table 4 the daily costs of a number of alternative systems are summarized. If running costs were the sole criterion, the choice would be for solid fuel in a modern combination grate. If cost were no object, electricity might be used. In actual fact, the convenience of a domestic fuel service is a consideration quite as important as that of cost. Even people of limited means are prepared to pay considerable sums in order that they may cook or have hot water whenever they want without having to keep a combination solid-fuel stove alight. To this the very wide use of gas and electric cookers, water heaters, and other apparatus bears witness. It is difficult to assess the monetary value of convenience, and the most that we can do is to compare like with like. If we do this, the alternatives are reduced to Schemes 9, 10, 11, and 12, with an added convenience factor in 11 and 12. Between these the variations in cost are hardly large enough to be significant, and one sees the full force of the "uncompromising all-gas heating policy," of which Mr. Crowther speaks in his Paper. The advantages of a complete gas fuel service to the housewife, to the family, and to the nation are so many and so great that it would still be worth attempting were there really great difficulties in the way. Is there actually any difficulty that a clear intention and the requisite effort will not remove?

Mr. **G. C. Holliday** (Gas Light & Coke Company): Dr. Hartley is indeed right when he says that the whole question of use of domestic fuel bristles with difficulties. The advantages and disadvantages of using each type of fuel must be considered not only in the light of running costs with which Dr. Hartley's Paper is mainly concerned but also in relation to industrial fuel requirements and in the light of nationally desirable objectives, such as coal conservation, smoke abatement, better standards of living, elimination of household drudgery, and so on—credits for which, though difficult to assess, cannot be ignored.

It is therefore of major importance that the right decisions should be made regarding the fuel and equipment of the millions of new homes that will be built after the war. Anyone reading Mr. Crowther's and Dr. Hartley's Papers might be forgiven if he concluded that the Gas Industry has not yet made up its mind on the problem.

From the figures in Table 4, Case A, it can be shown that the all-gas house requires 1–1¼ tons less raw coal to be mined per annum than the all-coal house, even though the efficiencies assumed for the coal appliances are high by present standards. To this substantial saving of coal must be added the value of the by-products obtained plus credits for smoke abatement and labour saved in the home.

If Dr. Hartley's figures for efficiencies and prices are accepted, fuel costs for more heat than most people are now getting, with coal gas and coke combinations thereof, are shown to lie between 3s. 7d. and 6s. 1d. per week, including one type of all gas service costing 5s. 2d. per week. Coal prices pre-war in the South were, I think, nearer 50s. than 40s. per ton, so that the cheapest all-coal house in the South would work out at 4s. 7d. per week. With coal at this price the average price of gas to compete would have to be 5d. per therm. Compare this with Case 12 for all gas service which works out at 5.6d. average price per therm.

It does not follow that price of gas service must be as low as that for coal, and there are many hundreds of thousands of consumers who would willingly pay an extra shilling or two per week to have all the advantages of a fuel on tap. If there is any reality in the promises of a better standard of living for the working classes, provision of automatic fuel service should rank high on the list of domestic amenities.

But if we are to think solely in terms of running costs, competitive with improved coal and coke burning appliances, the problem of providing the all-gas house with fuel at 4d.–5½d. per therm may be a difficult one. Whether or not gas can be sold at low average price depends largely, but not entirely, on seasonal load factor. A glance at the chart on p. 20 of Mr. Crowther's Paper shows that the load factor of an all-gas house is not a very good one. This is due mainly to the preponderating effect of the winter space heating load. It is important, therefore, to know at what price gas under present manufacturing conditions could be sold with such a load curve as this and with annual consumptions of about 600 therms. Is it 4d. or 5d., or considerably more?

Obviously domestic load factor can be greatly improved and cost of gas kept low by a judicious combination of gas and coke. If, for example, coke were used for space heating, the winter peak would be substantially reduced; or if gas were used for summer water heating and coke for part space heating, the load curve might be similarly improved. Different prices for gas in summer and in winter might also provide the necessary stimulus to change over from one fuel to the other. Knowledge of load curves for all types of gas appliances is necessary if we wish to find out what combination would give the optimum load factor.

Dr. Hartley says there will be an increased demand for better coal or coke ranges after the war. If solid fuel were to be adopted to any large extent for cooking in place of gas, gas load factor would be very seriously affected. Electricity has already eaten some way into our basic cooking load, and if coke and coal also are to join in the process gas will be still less favourably placed in competing for the other heating services. I find it hard to believe, however, that very many of the 9 million housewives now using gas or electricity for cooking would want to return to solid fuel, and I hope my suspicions that Dr. Hartley, in contemplating his new coke-fired range, is already regarding gas as a by-product, are incorrect. If the use of coke in the home is to be extended, it should be employed to even up the gas load, not to make it worse.

I do not think we can ignore the part which the electrical industry may play in domestic heating. Apart from probable long-term improvements in their conversion of coal by recovery of waste heat, we know that methods of improving load factor are under active consideration. The electrical peak load problem is much more acute than our own, and in any comprehensive planning by a Ministry of Fuel of our power and fuel resources the possibility of improving load factors in both the gas and the electrical industries will, no doubt, be explored in the national interest.

Mr. **L. W. Andrew**: Dr. Hartley is once again to be thanked for giving us so much vital technical information and for the promise of appliances of substantially greater efficiency than pre-war. I have not yet, however, recovered from the thought of a convector coke fire of 60% effective efficiency, and regret that the same 60% for the convector gas fire is assumed. So many data are presented that it is rather difficult to obtain a clear picture of exactly what Dr. Hartley feels should happen after the war, but he certainly takes solid fuel very seriously.

Is the combined solid fuel range, in its improved form, to be regarded as a desirable appliance for general use or only to serve a useful purpose when gas or electricity are unobtainable? There is such a wide difference in convenience and comfort between the combination solid fuel appliances and the independent solid fuel appliances and the automatic independent gas appliances that it seems worth while summarizing exactly what is the difference in cost to obtain different standards of convenience and comfort and what different appliances could be used for the same cost. I have taken Table 4 and reshuffled it to bring out this point:

Before using the figures in Table 4, it should be noted that when gas is used for cooking only the two-part tariff quoted increases the cost by over 8d. a week compared with gas at a flat rate of 9d. per therm—the 9d. per therm has therefore been used under these conditions of usage of gas. The class A standard is taken throughout.

1. For a cost of between 3s. 6d. and 4s. a week the following choice is available.

The complete combination of grate using coal or coke or the solid fuel cooker with boiler plus a convector fire—using coal and coke; or the gas cooker with either an open coke fire with back boiler or an independent coke boiler plus convector coke fire.

2. Between 4s. and 4s. 6d. a week.

The coke fire cooker with boiler and open coke fire, or the gas cooker with either an independent coal boiler plus convector coal fire, or an independent coke boiler plus open coke fire.

3. Between 4s. 6d. and 5s. a week:

The coal-fired cooker with boiler and open coal fire or the coal fired cooker with either the independent coal boiler and convector coal fire, or with independent coke boiler and open coke fire, or the gas cooker with open coal and back boiler, or the gas cooker with gas water heating and a convector or coke fire.

4. Beteween 5s. and 5s. 6d. a week:

The gas cooker, independent coal boiler, and open coal fire, or the gas cooker, gas water heating, and an open coke fire, or an all-gas service making use of the convector gas fire.

5. For 5s. 10d. a week there is the choice of either the solid fuel cooker plus independent boiler plus open fire—all using coal, or the all-gas service using the normal radiant gas fire.

Difficult as it is, one is tempted to risk tentative conclusions:

1. The complete combination grate and the solid fuel cooker are doomed if gas is accessible.

2. If every penny of running cost is important, then the convector coke fire needs serious consideration.

3. The development of a first-class convector gas fire would greatly widen the field of an all-gas service.

4. A small increase in standard of living brings very close the all-gas house.

There is one other point which should, however, be made clear. The key appliances—*viz.*, the improved combination grate, solid fuel fires with back boilers, convector gas, coal, and coke fires, &c., are appliances of the future, and the performance figures quoted are not those obtained at the moment on the appliances familiar in every home.

UNIVERSITY TRAINING AND THE GAS INDUSTRY

By Prof. D. T. A. TOWNEND

Mr. **John Terrace** : I am speaking as a gas engineer and not as Chairman of the Eductaion Committee of the Institution of Gas Engineers; and my reason for prefacing these remarks by this statement is that last year when I had the honour of reading a paper on "Academic and Technical Education in the Post-War Gas Industry" I was criticized for not making this clear.

The Education Scheme of the Institution performs a very useful function in the technical education of those engaged in the Gas Industry, and while I hope that it will continue with increasing success after the war is over, its objects should not be confused with the aims of education of post-war youth with particular reference to those likely to join the Gas Industry.

I welcome Professor Townend's remarks on the failure of those responsible for the selection of the brightest youths for scholarships to the universities. This applies not only to the secondary schools which have made great, if not always successful, strides in this important duty, but also to the headmasters of the public schools. If we agree that the youth of ability, whether he develop late or early, should be advised to carry his education beyond that received up to the school leaving age, it is up to someone, the school master, the gas engineer, or any friend interested, to do all he can to get such advice across to youth, who, after all, has often very little idea of what career he would like to follow. A boy with limited ability could continue his studies at a junior technical school, where he would receive an introduction to technical subjects, the study of which could be obtained later at evening classes. The brighter lads, however, should be encouraged to proceed to the university, and Professor Townend's remark that "university training has possibly hitherto been rather too specialized" and that "the degree title of 'Gas Engineering' is not popular among prospective students" are very much to the point.

When proceeding to a university few students have made up their minds as to an ultimate career and seek more general qualification. For our profession the main requirements are mathematics, physics, chemistry, and engineering, and a degree course covering these subjects, such as those outlined for gas engineering and chemical engineering at Leeds and other universities, should give a good sound basis on which to build.

The reference to economics and commerce are also very pertinent and would be of great service to those wishing to qualify for the higher executive posts in the Gas Industry.

Mr. **H. J. Hodsman** (Leeds University): In the days when change in the Gas Industry was slow, and when facilities for technical education were limited, the apprenticeship system as it then existed might amply meet the needs. To-day chemical industries are marked by rapid change, development of new methods and products, and there is no question of teaching a pupil a process not yet in existence. This necessitates the recruitment of a technical staff adequately trained and adaptable for future needs. Some such ideas were in their minds a generation ago, when the leaders of the Gas Industry used the Livesey Fund to endow a University Chair in Leeds. To-day few, if any, will deny the wisdom of that decision, after examining the careers of those who have passed through the University at Leeds into the Industry. Moreover, an example was set which has led to the recruitment of many from other universities.

Professor Townend wisely drew attention to the need for scrutinizing the trends in school education and the attitude of schoolmasters who influence their pupils in the choice of careers. Generally speaking, schoolmasters tend to direct the ablest boys by means of scholarships to the universities, and a conscious effort is needed to divert a proportion of these into the Gas Industry. The Livesey Chair offers a means to this end. It provides a further means to help those whose development comes after leaving school and to satisfy an ambition to spend three years or so in university study after a period in industry.

Existing facilities for this are too little known or too little used; such students are very welcome and their more mature outlook provides a wholesome influence on the younger men who come direct from school. Almost invariably their after-careers are successful. They are in my opinion the best fitted to assess the value of their university training and they are the first, in fact, to recognize it. The scholarship system, in my view, has one unfortunate influence. Competition is severe and tends to keep boys at school too long, at any rate, those who are destined for productive work.

The establishment of a degree course in chemical engineering at Leeds marks the close of a discussion which has taken a long time. Those who exploit chemical forces in industry may reasonably claim the title of chemical engineer and this may be true of most chemists experienced in manufacture. Gas chemists and engineers fall under this heading, but experience shows that the schoolmaster who often guides his pupils in their choice of a career is ill-informed about the career of gas engineering and for their benefit chemical engineering may be a more attractive title. It is desirable that the Gas Industry in the future should be equipped with a staff capable of dealing with their present and future problems of chemical engineering.

Mr. **A. McCulloch** (College of Technology, Manchester): In the University of Manchester, an honours degree course in Fuel Technology of three years' duration was instituted in 1924, and an Honours Course and a Diploma Course in Chemical Engineering in 1932. This later development allowed of the inclusion in the final year of the Fuel Technology Course of the principles of fluid flow and of heat transmission. Instruction in certain aspects of fuel technology is given to all students completing courses in general chemical technology, textile chemistry, and chemical engineering, and these students are required to satisfy the examiners in this particular. Manchester Fuel Graduates have found positions principally in the gas and associated industries, the iron and steel industry, the electric power industry, and with organizations devoted to fuel research.

The connexion between the matters dealt with by the teacher of abstract science and specific industrial operations is quite commonly lost. The student is thus left with only a hazy idea of the inter-relation of the various subjects which comprise his course. In this way, his obsession in time becomes a question of satisfying a board of examiners, rather than in understanding intelligently the purpose and scope of an industry, the application of scientific methods to the control of its processes, and the potentialities of a new scientific concept or discovery. His knowledge is thus in more or less mentally isolated compartments, and when he enters the industry he will discard that part of his knowledge for which he sees little or no application.

As a corrective to this state of affairs, at least two remedies might be suggested. If the number of students studying for a particular course could be increased, teachers of abstract science might be provided for each course of applied study. This is the kind of development one would expect to lead to the monotechnic scheme of technical education in which a single institution devotes all its resources and energies to, for example, the training solely of fuel technologists. The alternative is to increase the duration of the University Course. I doubt if it is possible to give an adequate grounding in, say, chemistry, physics, mathematics, and a language, as well as a good training in fuel technology, in a three years' graduate course, commencing with the Higher School Certificate qualification, when the constituent subjects of the course are dealt with as they are to-day. I suggest the student should first qualify in abstract science, and that his studies in fuel technology should follow. This is substantially the case at the Imperial College of Science and Technology. Final qualification here is followed by the award of a University diploma.

If for reasons of time and expense a course of five years cannot be contemplated, an effort should be made to ascertain to what extent the fundamental instruction can be condensed and simplified and related as closely as conditions permit to the special subject of study.

The desirability of a close association of industry and the university is obvious, and the Department of Coal Gas and Fuel Industries at the University of Leeds seems singularly fortunate in this respect. In this connexion, industry might well consider being represented, in part, by some of its more promising younger technical personnel who have not yet reached the highest administrative positions. Besides providing the machinery for making known to the university the nature of industrial problems, a Joint Committee of this kind might consider whether arrangements can be made for members of a university staff to spend occasional periods in industry, and whether both industry and the university might not greatly benefit by making the necessary financial provision for the exchange of university personnel with the personnel of universities abroad.

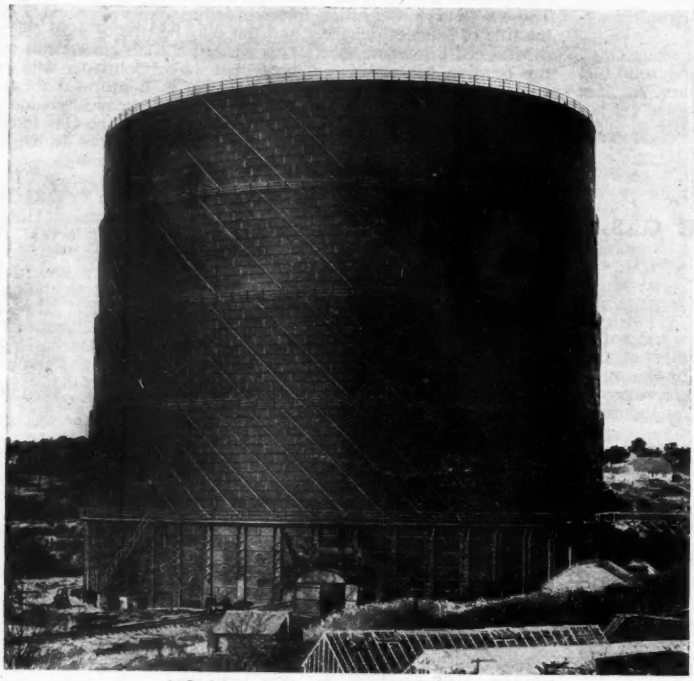
The research student learns not to be discouraged by the slow rate of progress which is invariably associated with all good scientific advance.

Mr. **C. A. Masterman** (Gas Light & Coke Company): We have heard much, and shall hear more, of reorganization. Professor Townend stresses need for quality in the human material with which such reorganization is concerned. Really good personnel can make almost any organization work after a fashion, but good organization can do little if the personnel is deficient.

In normal times, day by day, we are recruiting the Gas Industry of the future, both the rank and file and their leaders. Each recruit on the average will draw some thousands of pounds from the Industry. At its lowest, is there any other equally weighty financial commitment to which as an Industry we give so little intelligent consideration? It bears no comparison with our buying of coal, of plant, or of appliances.

The Author directs attention to the universities as a recruiting ground. I estimate upwards of 1% of the younger generation receives university training, so that for our Industry to take its quota merely on size would mean an annual intake of at least 50 university trained candidates. Do we?

On technical personnel the Author links recruitment with research.



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But we must not fling our problems at the professors like so many scraps of meat. We should encourage the professors to make excursions from their academic retreats, to familiarize themselves with the scope of our problems, to appreciate that industry is not an environment of easy money and easy scruples. Not only will technical help from the universities then become more effective, but the students will learn something at first hand of the interest a career in our Industry can offer. Our recruitment and the other help we get from Professor Townend's Department at Leeds is only an indication of what could and should be done over a wider field.

Professor Townend speaks of the "attractions of industry," which is a wider term than "interests." To attract the youngster of self-confidence and initiative, which is the type we want, we must offer a career of opportunity. Are we inclined instead to stress the merit of security which appeals to the less adventurous or older man? Broadly speaking, one gets in this world what one pays for, and one has to pay for what one gets!

Is there anything we can do to encourage the scheme for the providing of greater facilities of training for the young employee who shows promise? Without a recognized training a technical man finds his career limited, in my view unduly so, and his usefulness to his employer is also limited. Assuming he has shown himself likely to benefit from further training and the widening of approach to life which a university should provide, is he not a better investment than the raw, but fully trained candidate who expects to recover the cost of his qualification *via* higher initial salary? In both cases the employer pays, but in one he can study the form book while in the other he is backing a dark horse.

Post-War Building

The following is the constitution of the Gas Installations Committee convened by The Institution of Gas Engineers as one of the study committees of the Directorate of Post-War Building. Editorial comment on the matter is made on an earlier page.

Constitution.—Chairman, R. J. Rogers (Birmingham); Secretary, Dr. W. T. K. Braunholtz, M.A.; B. J. Bell (Cardiff), H. M. Browne, B.Sc. (London), R. D. Keillor (Greenock), S. Lacey, B.Sc. (London), R. N. le Fevre (London), F. Lorne, F.R.I.B.A. (P.W.B.), H. P. Lupton, B.Sc. (Liverpool), J. M. A. Mitchell (Newcastle-on-Tyne), H. Singleton (Huddersfield), and N. Smith (Bristol).

Gasification of Tar in Vertical Retorts

Woodall-Duckham (1920) Ltd. and W. T. Newton have taken out a patent (No. 544,500; application date, Dec. 5, 1940) relating to the gasification of tar, with the simultaneous cooling of the hot coke, in vertical retorts. According to the invention, tar is deposited in a finely-divided form on or in the hot coke in the region below the heating zone of a continuous vertical retort. The tar may be sprayed in finely-divided form, under pressure by pumping, by gravity feed from an overhead tank, or by steam injection on to the surface of the incandescent or hot coke, after the hot coke has left the lower end of the retort proper. For example, the tar may be introduced through a pipe running horizontally along the major axis dimension in the space above the coke-extractor mechanism. Alternatively, or in addition, finely-divided tar, or tar and steam, may be introduced through any of the cast iron or steel plates arranged below the retort brickwork, or through the lower section of the refractory brickwork of the retort itself below the actual heating zone.

Alternatively, the finely-divided tar, or tar and steam, may be injected into the coke column through the rotating shaft or member forming the coke-extractor mechanism, which is made hollow and is provided with outlet holes for the purpose.

The rate of supply of tar, or tar and steam, is so adjusted that all the tar is gasified or carbonized. Appropriate control of the rate of supply of tar avoids the formation of a sticky surface layer on the coke. An added precaution against the formation of such depositions on the coke is to arrange for the admission of steam below the region of tar admission; this steam cleans off any tar which may be left on the coke.

Correction.—The commencing salary for the position of temporary Technical Assistant to the Greenock Gas Department advertised in our issue of July 8 should read £250, and not £230, per annum.

To Meet the Demand for up-to-date information most commonly needed by users of tubes and fittings, Wellington Tube Works, Ltd., Great Bridge, Tipton, have issued an abridged catalogue of 64 octavo pages. Effectively illustrated, the catalogue gives a considerable amount of technical information, and lists of gauges and weights embodying wartime alterations are included by the courtesy of the British Standards Institution. The list has been widely distributed, and the Company invites those who may have any problems arising from the actual or potential use of tubes to send for Catalogue 65.

Papers at A.G.A. Conference

We are indebted to a valued correspondent for the following summary and brief comment on the Papers (seventeen were presented) at the Conference last May of the American Gas Association. Many of them, he writes, are of only limited interest to gas engineers in England because of the wide difference between conditions in the U.S.A. and those in this country.

L. J. Willien, Chicago, Ill., wrote on "Increasing Plant Capacity to meet Wartime Needs." This is a striking example of the differences between American conditions and our own. Oil is plentiful, accessible, and cheap in the States and, naturally, the American engineer flies to it for this purpose.

R. J. Horn, Central Hudson Gas & Electric Corporation, N.Y., wrote on "Increased Capacity in Water Gas Sets." His suggestion is to increase the internal diameter of the producers by the use of thin silicon-carbide walls backed by insulation of various types. He claims an increase of 40% above the normal rating in one instance, and that "these linings appear to have a life expectancy well beyond that necessary to justify their cost"; but, of course, that is American cost, where SiC is a native product.

W. Tiddy, of the Semet-Solvay Company, described an improved process of ammonium sulphate production from coke oven gas—one of the forms of the direct process.

Koppers issued a beautifully printed brochure describing "New Principles in Heating Koppers-Becker Coke Ovens." It refers mostly to ovens heated by "rich gas" with re-circulating of waste gases.

Frieda Fuchs, of the Pennsylvania State College, Penn., described a method for the "Microdetermination of Coal Ash," which is said to give results in the laboratory "consistent with the standard procedure" and to take much less time.

L. L. Newman, of the same college, wrote on the "Selection of Anthracite for Water-gas Operations."

J. H. Swiniarski and others, of Everett, Mass., wrote on the "Selection of Coals for Wartime Carbonization" by means of an improved engineering model of the coke oven. The apparatus is one of those in which the swelling stress of coals can be measured, and it looks very neat.

W. M. Pierce, an Insurance Company's Engineer, of Boston, Mass., wrote on "Scientific Methods applied to Accident Prevention." Our American confrères are very interested in this subject—one which does not seem to interest us as much as it should. The Paper is in very general terms.

W. A. Kemper and E. W. Guernsey, of the Baltimore Gas & Electricity Undertaking, wrote on "Organic Sulphur Compounds in Water Gas and Coke-oven Gas," a Paper which may be good reference when we get really interested in this subject. It is made clear that to reduce sulphur compounds by 60% at least 100 c.c. of wash oil must be used per cu.ft. of gas (equivalent to 22 gallons per 1,000 cu.ft. as against the normal 12 for benzole washing).

W. E. Stackhouse, Philadelphia, described recording apparatus for determining trace concentrations of certain impurities in industrial gases. It is a colorimeter in which the gas, after treatment with a suitable reagent, is projected on to a plate, the colour intensity of which is measured by photo-cells. It is particularly useful in the determination of nitric oxide in relation to gum formation. It can also be conveniently used for H_2S determination, as well as CS_2, NH_3, SO_2, and Cl.

C. W. Wilson, Baltimore, described a method for the determination of the quantity of suspended material in gas, which can be used for the determination of gum, oil fog, and the investigation of the "efficiency of filters for protecting pilots against stoppage." It is "an impingement device adapted for use on low-pressure gas. The suspended material is deposited on a microscope slip which is subsequently weighed."

C. J. Leuders, of Lynn, Mass., wrote on methods of dehydrating tar emulsions.

L. Shnidman and J. S. Yeaw, of Rochester, N.Y., wrote on the corrosion of stainless steels by flue gases. Out of 20 samples they got the longest life with 18% Cr and 8% Ni steel.

G. B. Johnson, of Minneapolis, wrote on "Metallizing," which is described as "a process of obtaining a mechanical bond between two metals, or a metal and a non-metallic material, by spraying pure metals on metallic surfaces without the use of flux and without preheating the object to be coated." Very high claims are made for the efficacy of this method in the maintenance of worn and corroded parts in gas engineering construction.

E. W. P. Smith, of the Lincoln Electric Company, Cleveland, Ohio, wrote on arc welding in gas plant maintenance. Particular reference is made to the process known as the "shielded arc," in which the molten metal is protected by an inert gas evolved by the covering of the electrode. Electric welding is being more widely used in this country, but the emphasis in the Paper is on the use of this method for repairs and maintenance of gas-works manufacturing and distributing plant.

A Meeting of the Fuel Luncheon Club will be held at the Connaught Rooms, W.C. 2, on July 21 (12.40 for 1.10 p.m.), when an Address will be given by Lord Hyndley, Controller-General at the Ministry of Fuel and Power. The cost of the luncheon to non-members will be 7s.; any visitor wishing to be present should forward his remittance to the Secretary of the Club, 30, Bramham Gardens, S.W. 5.

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Gas Products Prices

The London Market July 13.

The only change in the prices of Coal Tar Products in the London Market refers to 95/160 Solvent Naphtha, which is now about 2s. 3d. to 2s. 7d. per gallon.

The Provinces July 13.

The average prices of gas-works products during the week were: Pitch and Crude Tar,* Toluole, naked, North, 90's, 1s. 10d., pure, 2s. 5d. (controlled by the Control of Toluene No. 2 Order, July 3, 1941, which fixes the maximum price at which this material may be sold). Coal tar, crude naphtha, in bulk, North, 1s. to 1s. 4d. according to quality. Solvent naphtha, naked, North, 2s. 2d. to 2s. 6d. Heavy naphtha, North, 1s. 10d. to 1s. 11d. Carbolic acid, 60's, controlled by the Coal Tar Acids Prices (Inland) Order, 1942, operative from May 1. Naphthalene, controlled by the Naphthalene prices (Inland) Order, 1942, dated April 15, 1942, and operative from May 1, 1942, £19 to £19 10s.—bags free. Anthracene, controlled by the Anthracene Prices (Inland) Order, 1942, operative from May 1. Filtered heavy oil (min. gr. 1,080), 7½d. to 8d. Creosote oil has been generally controlled as to direction and price for some time past. Current value—fuel grades 5d. to 5½d; timber preservation and other purposes 4½d. to 6d. These prices apply as from May 13.

*In regard to pitch and crude tar prices we would ask readers to refer to the editorial note on p. 396 of the "JOURNAL" for Sept. 10, 1941.

Tar Products in Scotland July 11.

Deliveries are proceeding quite rapidly. Refined tar controlled. Value about 4½d. per gallon *ex* Works, naked. Creosote oil: Specification oil, 6½d. to 7d.; low gravity, 7¼d. to 7½d.; neutral oil, 6½d. to 7d. per gallon; all *ex* Works in bulk. Cresylic acid is difficult. Controlled price of refined grades is unchanged at 3s. 6d. to 4s. 6d. per gallon *ex* Works, naked, according to quality. Crude naphtha, 6½d. to 7d. Solvent naphtha: 90/160 grade, 2s. to 2s. 3d. per gallon and 90/190 Heavy Naphtha, 1s. 9d. to 2s. Pyridine: 90/160 grade, 13s., and 90/140 grade, 15s. per gallon.

Gas Stocks and Shares

There was more business on the Stock Exchange than during the previous week and British Funds were a particularly strong feature. The Gas Market was no exception to the general position, being particularly well supported, and prices all round were well maintained. Price changes both in number and value were negligible, however, the only increase of note being that of 5 points in Croydon debenture in the Supplementary List to bring it into line with current values.

A holding of South Suburban or Wandsworth 4% preference stocks at their present prices appears an attractive proposition. Business was done in the latter last week at 77 giving a yield of over 5%, and the former is quoted at 78½ and changed hands a fortnight ago at 80.

The following quotations were changed during the week:

OFFICIAL LIST

Brighton, Hove & Worthing 5 p.c. Cons.	70—75	+1
Commercial Ord.	34—39	−1
Imperial Continental Ord.	61—66	+1
Tottenham Ord.	86—91	+1

SUPPLEMENTARY LIST

Croydon 4 p.c. Deb.	90—95	+5

TRADE CARDS

FULL particulars of these spaces can be obtained on application to the Publishers. They are designed principally for the use of the firms whose display advertisements cannot be included owing to paper rationing.

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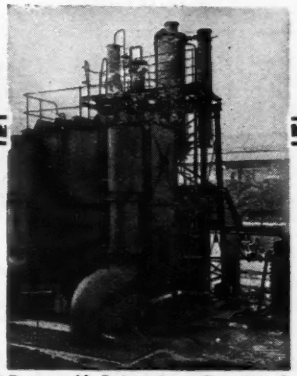
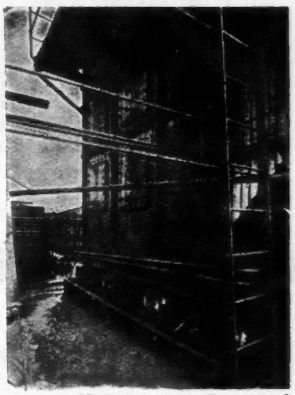


"Permac" Joints in a Gas Works.



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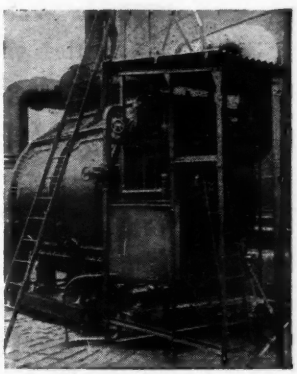

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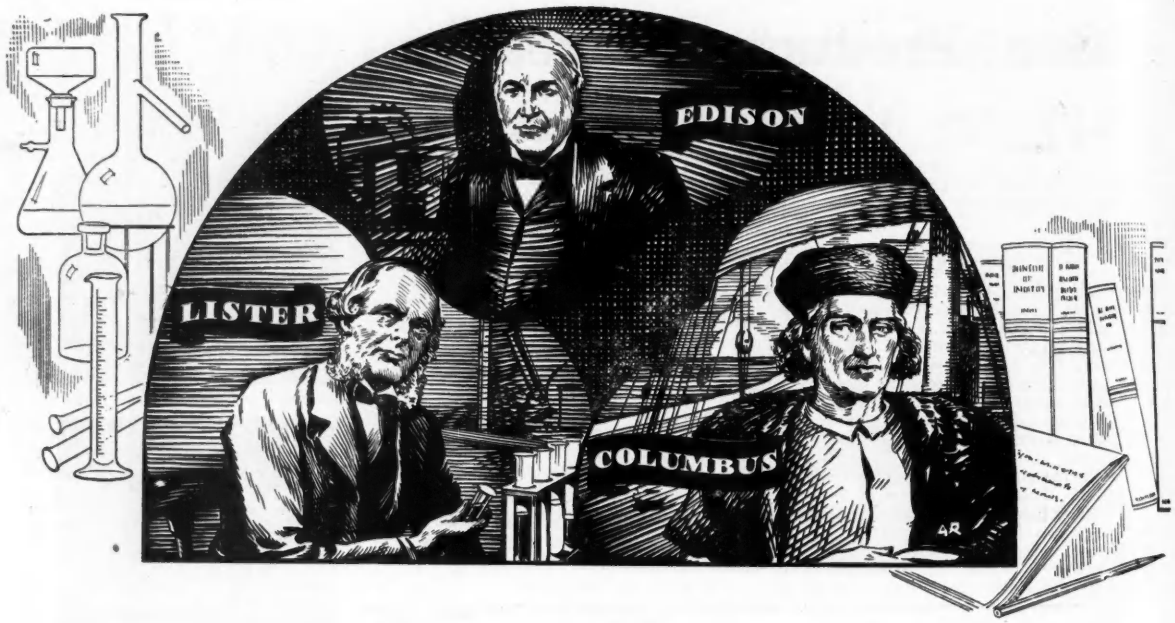

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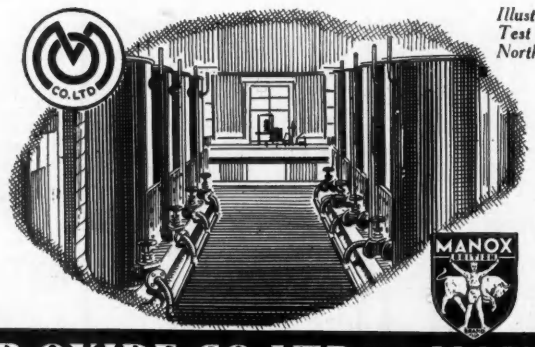

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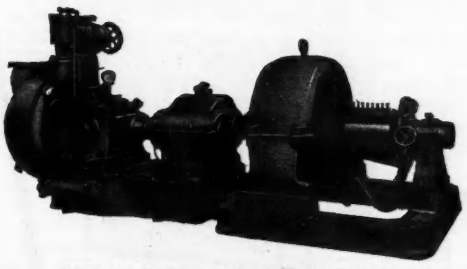

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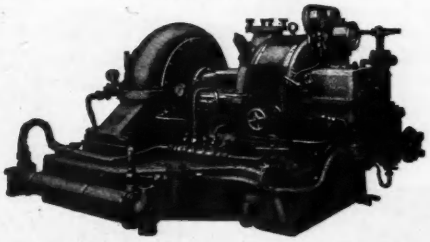

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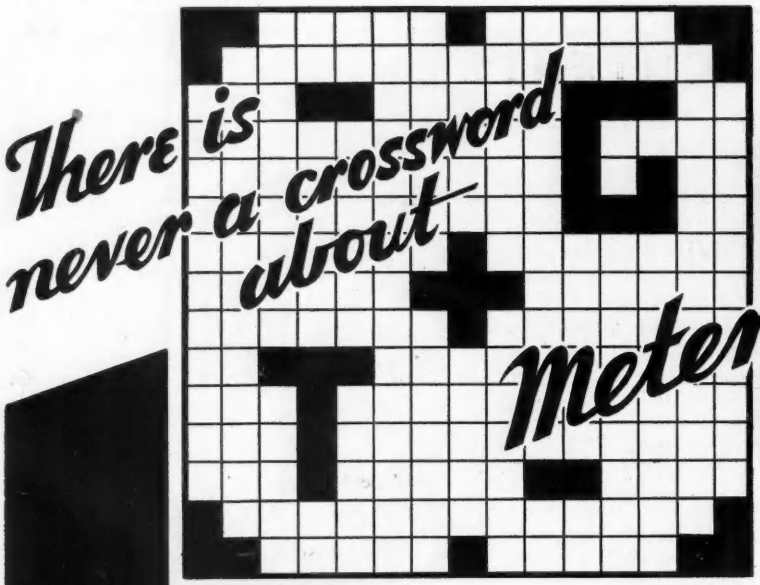

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